

Medical Force Protection: French Guiana

Medical Force Protection countermeasures required before, during, and after deployment to Ecuador are as follows:

Major Threats

Diarrheal disease, viral hepatitis A, typhoid and paratyphoid fever, malaria, dengue fever, Venezuelan Equine Encephalitis, leishmaniasis, sexually transmitted diseases, rabies (primarily from stray dogs), heat injury, industrial pollution, and altitude sickness (central region).

Presume local water sources are not safe for drinking.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
 - a. Ensure your Immunizations are up to date, specific immunizations needed for area: **Hepatitis A, MMR, Typhoid, Yellow fever, Tetanus (Td), and Influenza.**
 - b. If you have not been immunized against Hepatitis A (two dose series over 6 months) get an injection of Immunoglobulin with the initial Hepatitis A dose.
2. **Malaria Chemoprophylaxis:** There is a risk of malaria in all areas of French Guiana. Therefore, chemoprophylaxis is recommended. Drug resistance to Chloroquine also exists.
Recommended regimen: Mefloquine 250mg per week begun 2 weeks prior to entering country and continued weekly until 4 weeks after return from country.
Personnel in flight status: Doxycycline 100mg per day begun 2 days before entering country. Continue daily while in country and until 28 days after return.
Terminal prophylaxis (for both chemoprophylaxis regimens): **Primaquine 15 mg per day** for 14 days starting on day of departure from country of risk. **G6PD status must be determined prior to starting Primaquine.**
3. **Get HIV testing if not done in the past 12 months.**
4. **Complete attached Pre-Deployment Screening form and turn into your Medical Section.**
5. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it".**
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily "buddy checks" in tick and mite infested areas.
6. Continue malaria chemoprophylaxis.
7. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, and acclimatization to environment and stress management.
8. Eliminate food/waste sources that attract pests in living areas.
9. Avoid contact with animals and hazardous plants.
10. Consider **Acetazolamide (Diamox) 250 mg every 6 – 12 hours** for 1 – 2 days before ascent and continued for 48 hours **if traveling to elevations >2,500 meters**.

Requirements after Deployment

1. Continue malaria chemoprophylaxis.
2. Begin terminal malaria prophylaxis as described above.
3. Receive preventive medicine debriefing after deployment.
4. Seek medical care immediately if ill, especially with fever.
5. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.

FRENCH GUIANA
VECTOR RISK ASSESSMENT PROFILE
(VECTRAP)

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| <p style="text-align:center">Prepared by: Navy Disease Vector Ecology and Control Center Naval Air Station, Jacksonville, FL 32212-0043 MSG ADDRESS: NAVDISVECTECOLCONCEN JACKSONVILLE FL//MEI// PH: (904) 542-2424; DSN: 942-2424 FAX: (904) 542-4324; DSN FAX: 942-4324</p> |
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1. **GEOGRAPHY:** **Area** of 89,941 sq. km (43,740 sq. mi.), or about the size of Indiana. **Cities - Capital** is Cayenne (pop 38,135). Other major cities are Kourou (12000), St. Laurent du Maroni (6,984).

Terrain - Low-lying coastal plains tropical forests rising to hills (elev. 700 m).

2. **VECTOR-BORNE DISEASES:**

a. **Malaria:** *Plasmodium falciparum* and *P. vivax* are present countrywide including the urban areas year-round, at all altitudes. risk may be elevated from October through April; country-wide, risk from falciparum malaria (*Plasmodium falciparum*) greatest in western areas bordering Suriname. *P. falciparum* accounts for over 92% of the cases. Chloroquine resistant *Plasmodium falciparum* (CRPF) is present country-wide. Fansidar resistant *P. falciparum* is also present along the borders with Brazil and Guyana. Risk from vivax malaria (*Plasmodium vivax*) greatest in the east and along the coast. Incidence increased during the late 1980s, attributed in part to increases in drug-resistant strains of falciparum malaria. During 1989, incidence among Amerindians and Creoles near the borders with Brazil and Suriname was estimated at 300 to 900 per 1,000 population. Falciparum malaria accounts for about 70 percent of all cases, and strains resistant to chloroquine, amodiaquine, and quinine have been reported. The risk of acquiring malaria is considered high without the proper chemoprophylaxis and would result in a serious loss of combat effectiveness.

b. **Dengue fever:** Likely year-round in urban areas wherever vector populations exist. Endemic; levels are unclear, but the potential for outbreaks exists because the mosquito vector is present, and at least three dengue viral serotypes currently circulate regionally. During 1990, nearly 9 percent of sera from 327 suspected clinical cases were seropositive for dengue virus (unspecified; one isolate of dengue viral serotype 1 was reported from an unrelated case). The last extensive outbreak (attributed to dengue 2) occurred during 1986.

c. **Leishmaniasis** (*Leishmania braziliensis guyanensis*): Risk appears elevated during periods of low rainfall (usually October through December). Risk probably exists in most jungle areas, but most cases have been reported from the eastern half of the country. Attack rates up to 78 percent have been reported for military units operating in jungle areas. Most cases are cutaneous or mucocutaneous, caused by *L. guyanensis* and *L. amazonensis*, members of the *L. braziliensis* and *L. mexicana* complexes, respectively. The zoonotic reservoir for the former includes both ground level (rodents) and arboreal (edentates and marsupials) components, whereas the latter is maintained almost entirely by ground dwelling rodent hosts. Officially reported annual incidence remained relatively steady at about 2.3 cases per 1,000 inhabitants from 1979 through 1986. Increased risk reportedly has been associated with deforestation, but supporting data were not provided. Cases refractory to standard treatment regimes (Glucantime) have occurred.

d. **Bancroftian filariasis** is vectored by *Culex* species mosquitoes, and is endemic in coastal urban areas.

e. **Chagas' disease** (American trypanosomiasis), vectored by triatomid bugs, is endemic in rural areas but seldom reported.

f. **Yellow fever** was not reported during the 1980s, but one case occurred during 1990; potential exists for introduction from Brazil.

NOTE: The risk of acquiring filariasis, Chagas', or yellow fever is considered low. Of these, only yellow fever would significantly reduce combat effectiveness.

g. Cases of **human myiasis**, caused by the human bot fly (*Dermatobia hominis*), and **tungiasis**, caused by the chigoe flea (*Tunga penetrans*) occur frequently.

3. DISEASE VECTOR INFORMATION:

a. The main vectors for malaria are the mosquitoes, *Anopheles darlingi* and *An. aquasalis*. The primary vector species is *An. darlingi*, but *An. aquasalis* may be involved in coastal areas. Both species feed indoors, and larvae of *An. aquasalis* may be found in brackish as well as fresh water.

b. The mosquito, *Aedes aegypti*, is the vector of dengue fever. *Aedes aegypti* is reported resistant to the insecticides DDT, Dieldrin, and Lindane.

c. *Culex* species mosquitoes are the only significant vectors of Bancroftian Filariasis in French Guiana.

d. Sand flies, *Lutzomyia* species, are the main vectors of Leishmaniasis. Most sand flies are active between dusk and dawn and have very limited flight ranges. Potential vector species in French Guiana include *Lu. flaviscutellata* for *Leishmania amazonensis*, and *Lu. umbratilis* for *L. guyanensis*. *Lu. umbratilis* is more arboreal than *Lu. flaviscutellata*, and is readily attracted to artificial light sources.

e. The probable vector of Chagas' disease is the reduviid bug, *Triatoma infestans*.

4. DISEASE AND VECTOR CONTROL PROGRAMS:

a. Prevention & Control: Malaria chemoprophylaxis should be mandatory. Consult the Navy Environmental Preventive Medicine Unit #2 in Norfolk, VA (COMM: 757-444-7671; DSN: 564-7671; FAX: 757-444-1191; PLAD: NAVENPVNTMEDU TWO NORFOLK VA) for the current chemoprophylaxis recommendations.

b. Yellow fever immunizations should be current.

c. The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. The most important personal protection measures include the use of DEET insect repellent on exposed skin, wearing permethrin-treated uniforms, and wearing these

uniforms properly. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) during daylight and evening/night hours is recommended for protection against a variety of arthropods including mosquitoes, sand flies, other biting flies, fleas, ticks and mites. Uniforms should be treated with 0.5% permethrin aerosol clothing repellent (NSN 6840-01-278-1336), per label instructions. NOTE: This spray is only to be applied to trousers and blouse, not to socks, undergarments or covers. Reducing exposed skin (e.g., rolling shirt sleeves down, buttoning collar of blouse, blousing trousers) will provide fewer opportunities for blood-feeding insects and other arthropods. Additional protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters, and by limiting the amount of outside activity during the evening/night hours when possible. Bednets (insect bar [netting]: NSN 7210-00-266-9736) may be treated with permethrin for additional protection.

d. The most important element of an *Aedes aegypti* control program is SOURCE REDUCTION. Eliminating or covering all water holding containers in areas close to human habitation will greatly reduce *A. aegypti* populations. Alternatively, containers may be emptied of water at least once a week to interrupt mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes near encampments.

e. Because the breeding habitats of most sand fly species are not easily identified, not easily accessible, or unknown, control strategies focus mainly on adult sand flies. Peridomestic sand fly species can be controlled by spraying residual insecticides on buildings (including screening on portals of entry) animal shelters, and other adult resting sites. Area chemical control of sylvan sand fly species is impractical. Personal protective measures will reduce sand fly bites and environmental modification (e.g., clearing forests, eliminating rodent burrows/breeding sites, relocating domestic animals away from human dwellings) has been used to reduce local sand fly populations.

f. Expanded Vector Control Recommendations are available upon request.

5. IMPORTANT REFERENCES:

Contingency Pest Management Pocket Guide - Fourth Edition. Technical Information Memorandum (TIM) 24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual - Sixteenth Edition. 1995. Edited by A. S. Benenson. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures - (MEDIC). September 1997. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made

to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is www.promedmail.org:8080/promed/promed.folder.home.

Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at www.uq.edu.au/~ddbfry/. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.